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QRF-1008
ISM Band 433MHz RF Module
User Manual (A7108)
(Preliminary)

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<Rev. 0.1>

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Revision History

Version	Description of Change	Editor	Date
0.1	Initial version	Kevin	2012/10/19

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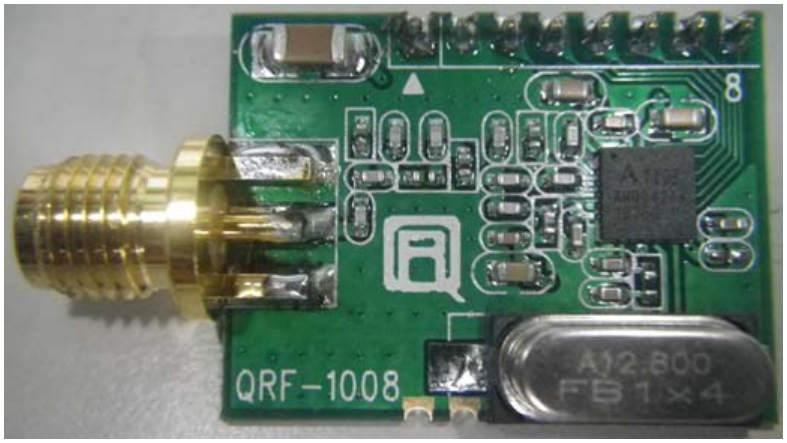
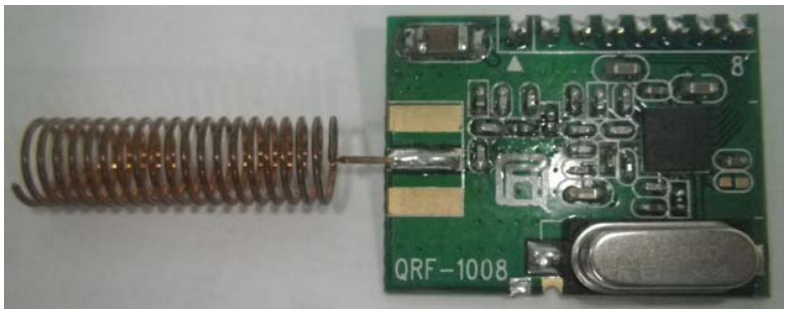
1. GENERAL INFORMATION

The QRF-1008 module is a high output power (over 17dBm) system that integrates AMICCOM's A7108 FSK/GFSK transceiver, other necessary components such as crystal, resistors and capacitors. The purpose of the QRF-1008 module is to provide our customers a flexible and reliable module for their application development. The interface of QRF-1008 module is a simple connector including power, ground, 4-wire SPI. It provides a simple and convenient way to connect to various MCU.

A7108 integrates a linear, high-efficiency power amplifier designed for 433MHz ISM band applications, for excellent RF performance, reliability and temperature stability.



*** PCB details front view of QRF-1008 module with SMA Connect.**



*** PCB details front view of QRF-1008 module with helix antenna.**

2. PCBA DIMEMSION AND MECHANICAL DRAWING

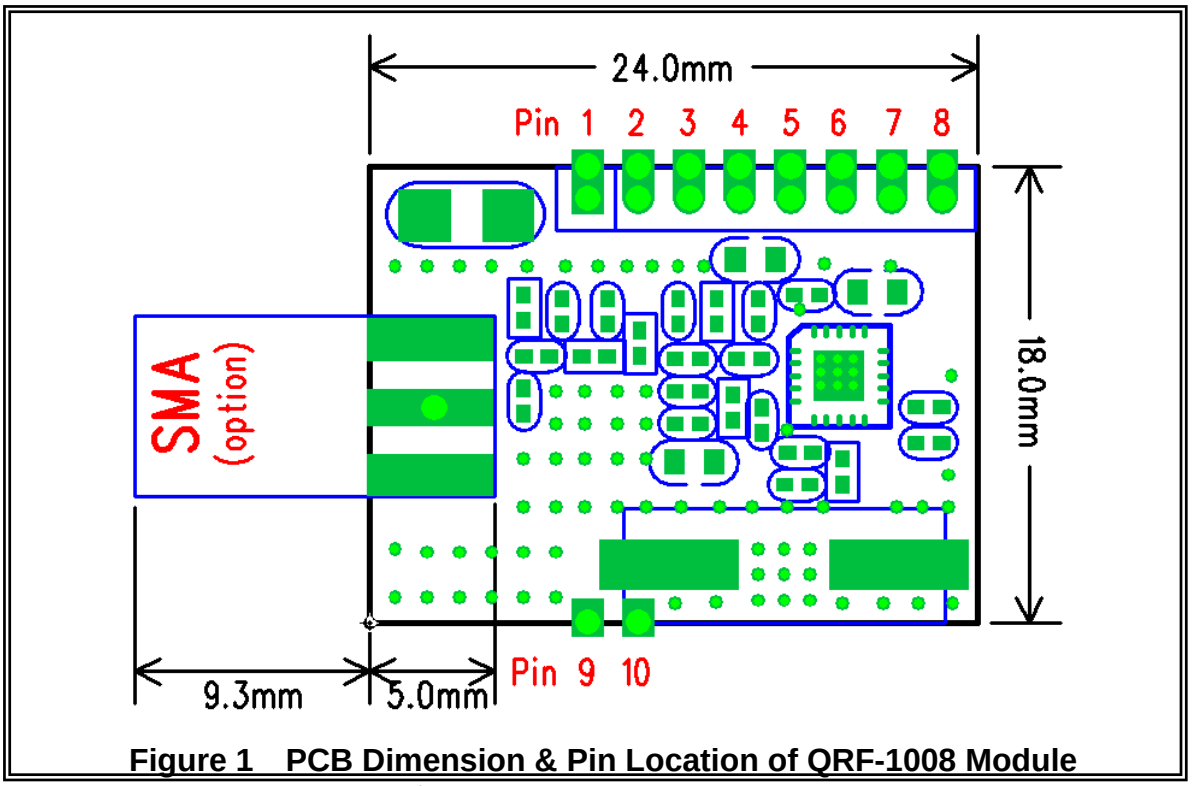


Figure 1 PCB Dimension & Pin Location of QRF-1008 Module

Note 1: The PCB size is 24 x 18 (mm^2).

Note 2: The PCBA thickness is 4.8 mm (the highest component without SMA connector , Antenna and Pin header)

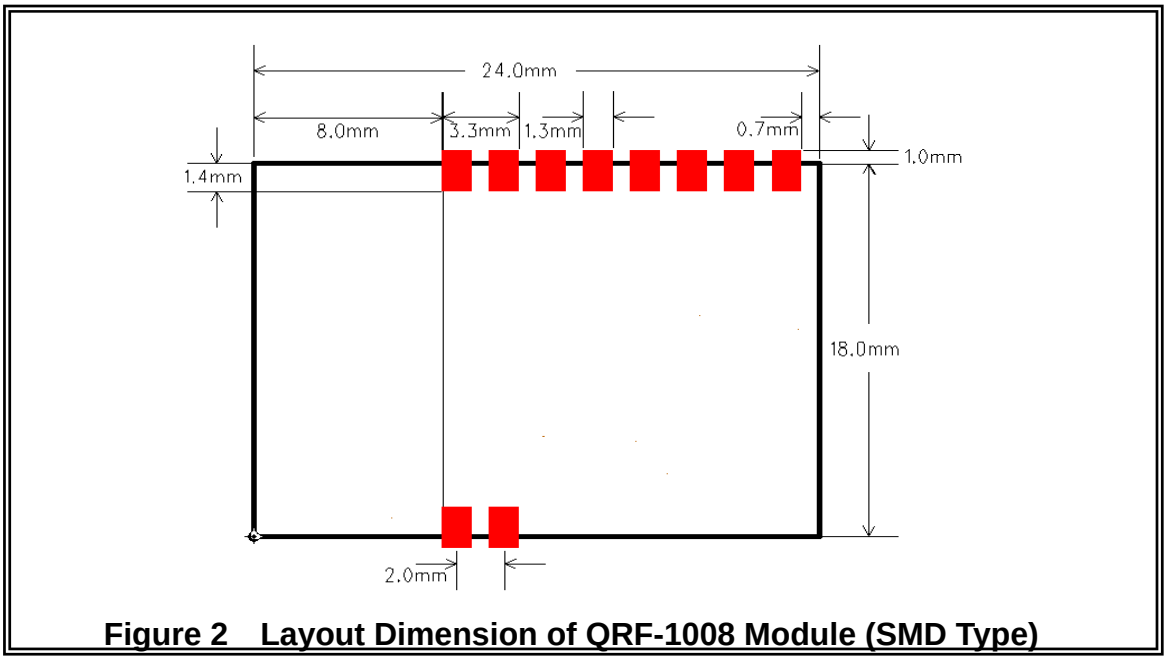


Figure 2 Layout Dimension of QRF-1008 Module (SMD Type)

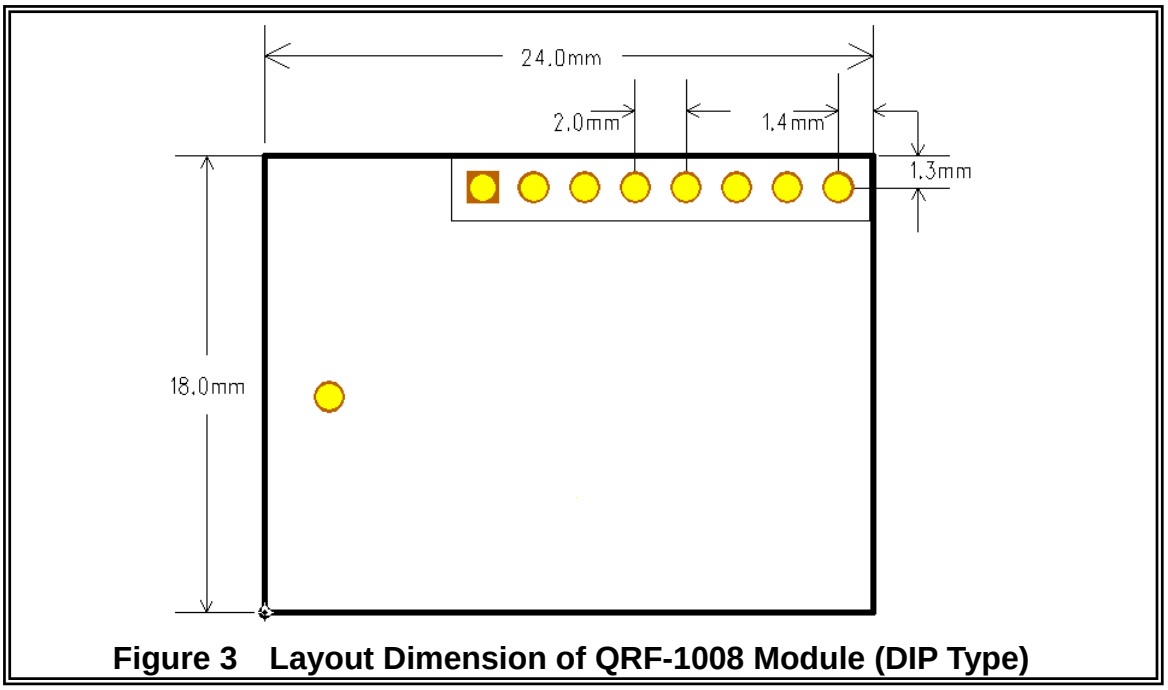


Figure 3 Layout Dimension of QRF-1008 Module (DIP Type)

Note 1: Drill diameter = 0.94mm

Note 2: Pin header is standard parts for 2.0mm pitch.

3. ANTENNA

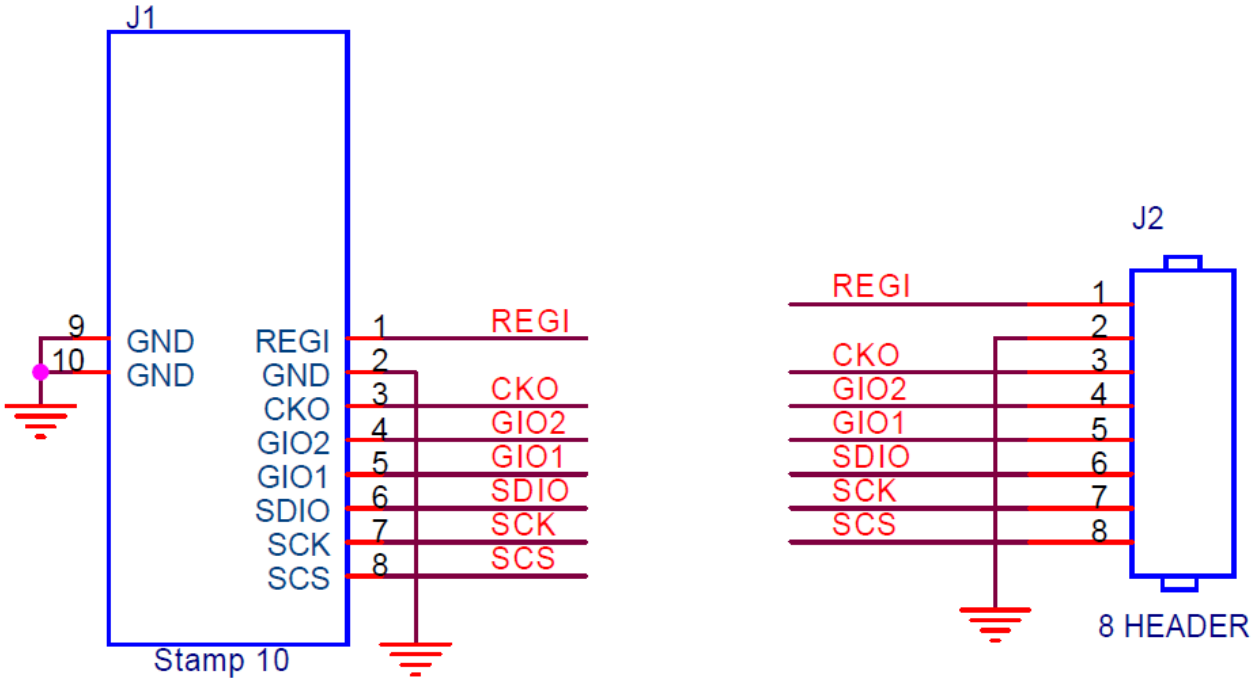
QRF-1008 module has two antenna options. One is to use a 50 ohm helix antenna and other is an external dipole antenna connected to the SMA connector port.

4. POWER SUPPLY

QRF-1008 module does not need its power supply since power is supplied by MCU board through the 8-pin connector or 10-pin stamp hole.

Pin 1 is power input on QRF-1008 module. The voltage range is from 2.0V to 3.6V

5. QRF-1008 PAD DEFINITION & MCU Interface



Pad number	Name	Function	Remark
1	REGI	Power Supply	3.3V
2	GND	Ground	
3	CKO	Multi-function clock output	A7108 PIN17
4	GIO2	Multi-function IO2/SPI data output	A7108 PIN16
5	GIO1	Multi-function IO1/SPI data output	A7108 PIN15
6	SDIO	SPI Data I/O	A7108 PIN14
7	SCK	SPI Clock	A7108 PIN13
8	SCS	SPI Chip Selection	A7108 PIN12
9	GND	Ground	SMD Type only
10	GND	Ground	SMD Type only

6. ELECTRICAL SPECIFICATIONS

Absolute Maximum Rating	
VCC	0 ~ 3.6V
Storage temperature	-40°C to +120°C
Operating temperature Range	-20°C to +70°C

WARNING: Exceeding any of these ratings will void the warranty and may damage the device

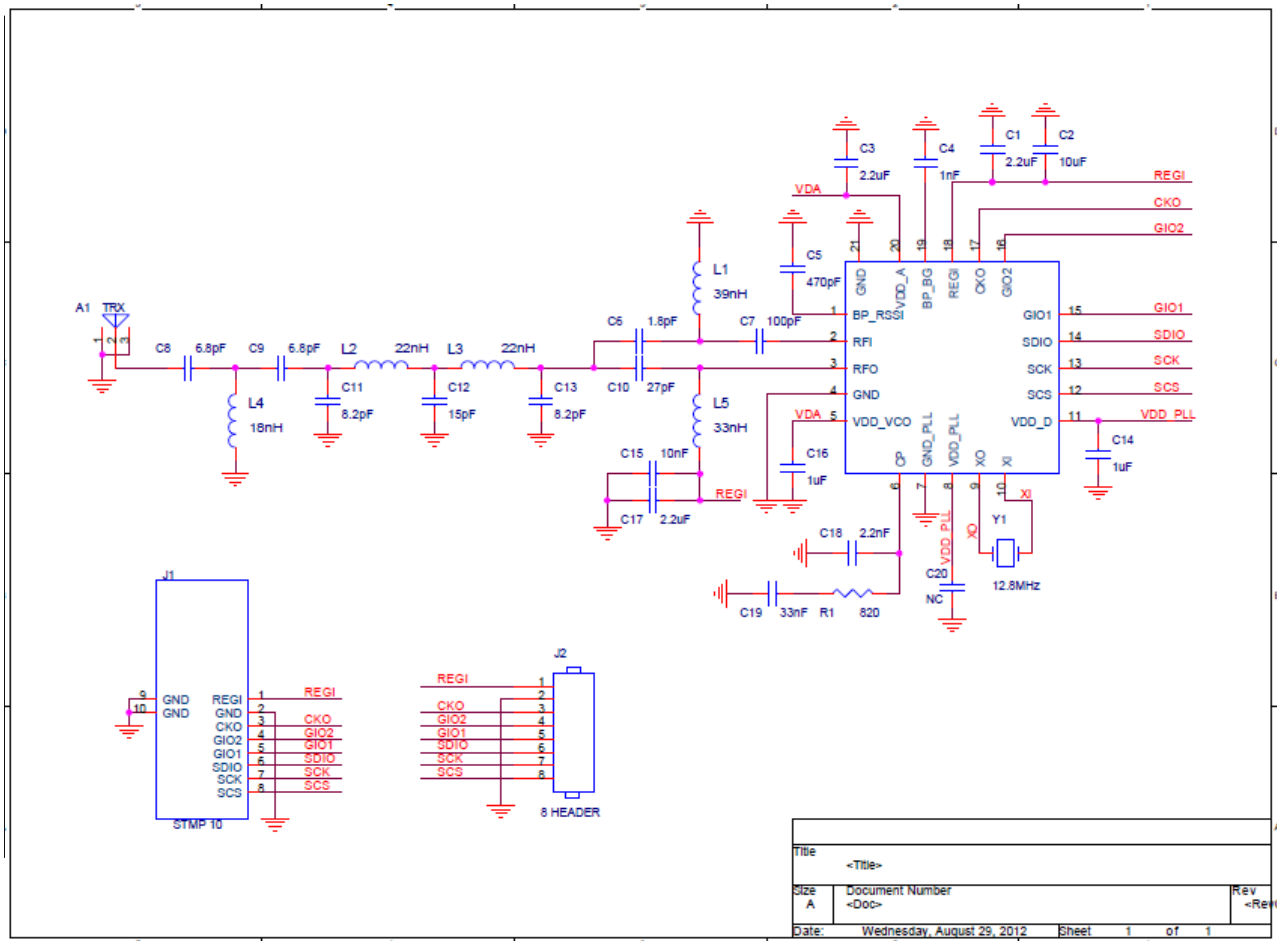
Parameters	Min	Typ	Max	Units
Supply voltage	2	3.3	3.6	V
Current consumption				
Deep Sleep mode		0.2		uA
Sleep mode		2		uA
Idle mode		0.25		mA
Stand-by mode		1.5		mA
PLL mode		8.5		mA
Rx mode(AGC ON)		14.5		mA
Tx mode (-12dBm, TBD=0,TDC=0,PAC=0)		16		mA
Tx mode (1dBm, TBD=1,TDC=0,PAC=0)		20		mA
Tx mode (5dBm, TBD=2,TDC=0,PAC=0)		22		mA
Tx mode (10dBm, TBD=3,TDC=0,PAC=0)		30		mA
Tx mode (13dBm, TBD=4,TDC=0,PAC=0)		39		mA
Tx mode (15dBm, TBD=5,TDC=0,PAC=0)		48		mA
Tx mode (16dBm, TBD=6,TDC=0,PAC=0)		55		mA
Tx mode (17dBm, TBD=7,TDC=2,PAC=1)		70		mA
Tx mode (17.5dBm, TBD=7,TDC=3,PAC=3)		78		mA
Transmit output power (Pass CE) *1		13.5		dBm
Rx Sensitivity				
2Kbps mode, Dev=8KHz, IFBW=50KHz		-117		dBm
2Kbps mode, Dev=8KHz, IFBW=100KHz		-114		dBm
10Kbps mode, Dev=18.75KHz, IFBW=50KHz		-114		dBm
10Kbps mode, Dev=37.5KHz, IFBW=100KHz		-112		dBm
50Kbps mode, Dev=18.75KHz, IFBW=50KHz		-110		dBm
100Kbps mode, Dev=37.5KHz, IFBW=100KHz		-107		dBm
150Kbps mode, Dev=56.25KHz, IFBW=150KHz		-106		dBm
250Kbps mode, Dev=93.75KHz, IFBW=250KHz *2		-103		dBm

Other	Specification	Units
Frequency	433.92	MHz
Modulation	FSK/GFSK	
Dimension	24(L) x 18(W)x 4.8(H)	mm

Note 1: To pass CE, the setting of TBG, TDC, PAC maybe changed with different antenna.

Note 2: For 250Kbps data rate mode, customer should use 16MHz X'tal. Please refer to A7108 data sheet for detail.

7. CIRCUIT DIAGRAM



8. BILL OF MATERIAL

Item	Quantity	Reference	Part	Size
1	1	C6	1.8pF	0402
2	2	C8, C9	6.8pF	0402
3	2	C11, C13	18.2pF	0402
4	1	C12	15pF	0402
5	1	C10	27pF	0402
6	1	C7	100pF	0402
7	1	C5	470pF	0402
8	1	C4	1nF	0402
9	1	C18	2.2nF	0402
10	1	C15	10nF	0402
11	1	C19	33nF	0402
12	2	C14, C16	1uF	0402
13	3	C1, C3, C17	2.2uF	0603
14	1	C2	10uF	1206
15	1	L4	18nH	0402
16	2	L2, L3	22nH	0402
17	1	L5	33nH	0402
18	1	L1	39nH	0402
19	1	R1	820R	0402
20	1	A1	Antenna	
21	1	Y1	12.8MHz	US49
22	1	U1	A7108	QRF20P
23	1	C20	NC	0402

9. REFERENCE DOCUMENTS

9.1 AMICCOM A7108 datasheet

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